

REMARKS

Claims 1, 5, 7, 8, 11, 12, and 14 have been amended.

Claims 13 and 17-21 have been canceled.

Claims 22 and 23 have been added.

Claim Objections

The Examiner has objected to claims 1-12, 18, and 21 because of various informalities. The informalities have been corrected.

Claim rejections under 35 U.S.C. §112

The Examiner has rejected claims 1-12, 14, and 19 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Claims 1, 8, and 12 have been amended in order to address the Examiner's antecedent basis rejections, as well as Examiner's concern about the word "calculating," and also to generally clarify the operations involved and present them consistently.

Claims 11 and 14 have been amended to correct minor defects pointed out by the Examiner.

Claim rejections under 35 U.S.C. §102

The examiner argues first that claims 1-4, 8-10, 12, 13, 17 and 19-21 are anticipated by Cann, (U.S. Patent 5,155,365). Claims 14 to 16 now depend from claim 1. Independent claims 1 and 12 remain.

With respect to claim 1, it would appear that the prior art shows a measurement of emissions at one energy from within the sample (typically a human body) along a path to the detector which is corrected for the attenuation caused by the sample lying along that path. The attenuation is quantified by simultaneously investigating that same path at two other energies using an x-ray source. The effect of the sample on the externally generated emissions at the two other energies passing along the path gives rise to a measure of the path length contribution, along that path, of the bone, tissue and fat present, for instance. These path lengths are then used in combination with published values for the attenuation effect of those material types at the energy of the emissions arising from within the sample. In effect, length x multiplied by published effect value a for bone at energy e, is added to length y multiplied by effect value b for

tissue at energy e , is added to length z multiplied by effect value c for fat at energy e , so as to give the total effect for which correction is required. Correction for this total effect is then provided. This is the methodology described at column 5, lines 15-30. This is a direct correction of the emissions based upon the effect of the material actually present in that instance.

Whilst the methodology used in Cann is complex, it is also entirely different from that used in the present claimed invention. Specifically, amended claim 1 requires:

calculating a value for a relationship of equivalent type to the first determined relationship to provide a calculated relationship, the calculation being based on functions of an element's absorption of emissions and the amount of that element potentially encountered by emissions, for one or more elements;

adjusting one or more variables / functions in the calculated relationship to reduce the difference between the value of the first determined relationship and the value of the calculated relationship for the sample at a plurality of the energies of emissions from the generator, so giving a derived calculated relationship; and

obtaining the forms of the one or more variables/functions of the derived calculated relationship and using those forms for the variables/functions in the calculation of the value of the calculated relationship at the sample source emission energy or energies requiring correction and correcting the detected level using those values for the calculated relationship.

There is nothing within Cann which could be equated to the above claim language.

Comparing Cann with claim 1, the effort in Cann goes into obtaining the equivalent of the first determined relationship. There is no separate establishment of a value for a calculated relationship of the type stated in claim 1, which reads, in part: "adjusting one or more variables / functions in the calculated relationship to reduce the difference between the value of the first determined relationship and the value of the calculated relationship for the sample at a plurality of the energies of emissions from the generator, so giving a derived calculated relationship". This distinct feature of the present invention is in effect a theoretical model of the attenuation based on various assumptions and is separate from the consideration of the observed effects. Cann is solely concerned with the observed effect and works on those.

Nowhere within Cann is there any mention of comparing a value for a calculated relationship (model) with a value for a determined relationship (observed). Cann considers the observed results and does not try and derive a model from them or consider them against a model. Nor does Cann go on to adjust part of the form (variable or function) of the calculated relationship so as to bring the values of the calculated relationship (model) and determined relationship (observed) closer together. No derived calculated relationship provided in this way is obtained in Cann. Cann does not seek to use observed data to establish a model, but rather uses the observed data directly to correct.

Because of this derived calculated relationship, the method of the present invention allows for correction at any desired energy. Cann merely corrects using the observed data directly. As stated in the present application as filed, pages 18 and 19, the mono-energetic approach of most prior art and the approach used in Cann may be suited to certain circumstances, but increasingly become assumptions away from the known energies. It is worth noting that in Cann the emissions from within the sample are well known in terms of their energy because they are of a known nature introduced as part of a medical procedure. The present invention is particularly interested in nuclear waste materials where such prior knowledge is rarely available and cannot be assumed.

The additional claimed steps of the present invention distinguish over Cann and enable an improved methodology to be provided which is more accurate and more widely applicable in investigating nuclear waste, for instance.

Claim 12 is believed to be fully distinguished from the present invention for similar reasons.

The other claims are allowable as they depend from an allowable claim. Additional novel and inventive features are contained in many of them.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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